

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 23 FEB 2006

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Applicant's or agent's file reference 05589.0003.00PC00		FOR FURTHER ACTION		See Form PCT/PEA/416
International application No. PCT/EP2004/011833		International filing date (day/month/year) 18.10.2004	Priority date (day/month/year) 17.10.2003	
International Patent Classification (IPC) or national classification and IPC F24F5/00, F28D5/00				
Applicant OXYCELL HOLDING BV et al				
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau a total of 3 sheets, as follows:</p> <p style="margin-left: 40px;"><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p style="margin-left: 40px;"><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>				
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input checked="" type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>				
Date of submission of the demand 17.08.2005		Date of completion of this report 24.02.2006		
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016		Authorized Officer De Graaf, J.D. Telephone No. +31 70 340-3914		



**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/EP2004/011833

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1-19 as originally filed

Claims, Numbers

1-19 filed with the demand

Drawings, Sheets

1/5-5/5 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☒ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☒ the claims, Nos. 20-26
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/EP2004/011833

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-19
	No: Claims	
Inventive step (IS)	Yes: Claims	1-19
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-19
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VI Certain documents cited

1. Certain published documents (Rule 70.10)

and / or

2. Non-written disclosures (Rule 70.9)

see separate sheet

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1) Reference is made to the following document:

D1: US-B1-6 338 258 (LEE DAE YOUNG ET AL) 15 January 2002 (2002-01-15)

2) The document D1 is regarded as being the closest prior art to the subject-matter of claim 1 , and shows (the references in parentheses applying to this document):

A dew point cooler (2) comprising a heat exchange element (36,34), the dew point cooler operating in a counterflow wherein a product air stream flows over a first side of the heat exchange element (dry channel 31) and is cooled by heat transfer to the element (36,34) and wherein a portion of the product air stream is diverted back over a second side of the heat exchanger element (wet channel 33), the second side of the heat exchange element being provided with a supply of water (8) whereby heat transfer from the heat exchange element (36,34) to the water causes it to evaporate into the air stream, where the heat exchange element (34) comprises a membrane (36) and a formed heat exchange part (34) attached to the membrane (36).

The subject-matter of claim 1 differs from this known dew point cooler in that the formed heat exchange part is made of a laminate comprising a formable carrier layer at least partially covered with a flexible liquid retaining layer having an open structure such that in use, a heat exchange medium can directly contact the carrier layer through the open structure of the liquid retaining layer.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as to improve the design of dew point coolers with respect to the production process. By using a formable laminate covered with a flexible liquid retaining layer as a basis for the formed heat exchange part, the heat exchange part can be attached to the membrane directly after forming (e.g. in a mould) has taken place, without an additional step of applying a liquid retaining layer.

**INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(SEPARATE SHEET)**

International application No.

PCT/EP2004/011833

The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons: None of the available prior art documents suggest the use of such a laminate for the heat exchange part, to be attached to a heat conducting membrane, in the wet side part of a dew point cooler.

Claims 2-15 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

3) Method claim 16, is not clear (in particular the meaning of "a membrane" and the relation of the membrane to the dew point cooler (Art. 6 PCT)) and has been considered as follows (underlined, in bold an addition added by examiner):

A method of manufacturing a dew point cooler **according to claim 1**, comprising:
providing a heat exchange laminate comprising a formable layer at least partially covered with a flexible liquid retaining layer having an open structure;
forming the laminate into a plurality of elongate fins; and
attaching the fins to a first surface of a membrane for heat transfer thereto to form a heat exchange element.

Document D1 shows a dew point cooler provided with a plurality of formed elongate heat exchange fins, attached to a first surface of a membrane for heat transfer thereto to form a heat exchange element.

The subject-matter of claim 16 differs from this known dew point cooler in that the heat exchange fins are made of a formed laminate comprising a formable carrier layer at least partially covered with a flexible liquid retaining layer having an open structure, the manufacturing method further comprising the step of forming the laminate into a plurality of elongate fins.

The subject-matter of claim 16 is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as to improve the manufacturing process of dew point coolers. By using a formable laminate covered with a flexible liquid retaining layer as a basis for the formed heat exchange part, the heat

**INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(SEPARATE SHEET)**

International application No.

PCT/EP2004/011833

exchange part can be attached to the membrane directly after forming (e.g. in a mould)
has taken place, without an additional step of applying a liquid retaining layer.

The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons: None of the available prior art documents suggest a manufacturing step of forming a laminate into a plurality of elongate fins (to be attached to a heat conducting membrane, in the wet side part of a dew point cooler).

Claims 17-19 are dependent on claim 16 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

Re Item VI

Certain documents cited

Certain published documents

Application No Patent No	Publication date (day/month/year)	Filing date (day/month/year)	Priority date (valid claim) (day/month/year)
WO2004/040219	13-05-2004	31-10-2003	31-10-2002
WO2005/019739	03-03-2005	20-08-2004	20-08-2003